

REMARKS

In the Office Action, the Examiner noted that claims 1-20 are pending in the application, and that claims 1-2, 4, 6, 9-10, 12-13, and 17-18 are rejected. The Examiner objected to claims 3, 5, 7-8, 11, 14-16, and 19-20. By this response, claims 1 and 3 are amended and claims 2 and 4-20 continue unamended. Notably, claims 1 and 3 have been broadened by amendment to afford the Applicant the proper scope of his invention. In view of the above amendments and the following discussion, the Applicant submits that none of the claims now pending in the application are anticipated under the provisions of 35 U.S.C. §102 or obvious under the provisions of 35 U.S.C. § 103. Thus, the Applicant believes that all of these claims are now in condition for allowance.

I. OBJECTIONS

A. Drawings

The Examiner has objected to the drawings as failing to comply with 37 C.F.R. §1.83(a). Specifically, the Examiner stated that the drawings do not show a "groove, lip, or ridge formed within an interior of the waveguide," as recited in the Applicant's claim 7.

The Applicant has amended FIG. 2 to support the features of claim 7. In particular, a reference character 207 has been added to FIG. 2 to generally identify "a groove, lip, or ridge", which is described in paragraph [0021] of the Applicant's specification. No new matter has been entered. As such, the Applicant respectfully requests that the objection be withdrawn.

B. Claims

The Examiner objected to claim 1 as containing a typographical error. In particular, the Examiner noted that the phrase "at a second substrate mounted..." should be "a second substrate mounted." The Applicant has amended claim 1 to correct the typographical error. As such, the Applicant respectfully requests that the objection to claim 1 be withdrawn.

In addition, the Examiner has objected to dependent claims 3, 5, 7-8, 11, 14-16, and 19-20 as being dependent upon rejected base claims, but would be allowable if

rewritten in independent form. The Applicant thanks the Examiner for indicating allowable subject matter but believe independent claims 1, 9, and 17, from which these dependent claims depend, are allowable over the prior art of record for the reasons set forth below. Thus, the Applicant contends that claims 3, 5, 7-8, 11, 14-16, and 19-20 should distinguish over the prior art of record since each claim depends from one of independent claims 1, 9, and 17. As such, the Applicant respectfully requests that the objection to claims 3, 5, 7-8, 11, 14-16, and 19-20 be withdrawn.

II. REJECTION OF CLAIMS UNDER 35 U.S.C. §102(b)

The Examiner rejected claims 1 and 17 as being anticipated by Hirtzlin (United States patent 6,297,714, issued October 2, 2001). The rejection is respectfully traversed.

More specifically, the Examiner alleged that Hirtzlin shows a waveguide having first and second substrates mounted within the waveguide. (Office Action, page 3). The Examiner further alleged that Hirtzlin shows a first probe on the first substrate that transmits signals from a transmission unit and a second probe on the second substrate that receives signals to a reception unit. (Office Action, page 3). The Examiner concluded that Hirtzlin anticipates the Applicant's invention as recited in claims 1 and 17. The Applicant respectfully disagrees.

Hirtzlin teaches a first waveguide for transmission and reception of signals and a second waveguide for transmission of an oscillator signal originating from a reception circuit to a transmission circuit. (See Hirtzlin, Abstract). In particular, as shown in FIG. 2 of Hirtzlin, the first waveguide 9 is divided into parts by two microstrip circuit boards 13 and 14. (Hirtzlin, col. 3, lines 10-30). The first waveguide 9 penetrates the two circuit boards 13 and 14 through openings therein. (See FIG. 2). One side of each of the circuit boards 13 and 14 is metalized, and another side of each of the circuit boards 13 and 14 include a probe 15 and 16, respectively. (Hirtzlin, col. 3, lines 35-42). In addition, the second waveguide 20 also penetrates the two circuit boards 13 and 14 through openings therein. (Hirtzlin, col. 3, lines 65-67).

In view of the foregoing, Hirtzlin does not teach each and every element of the Applicant's invention as recited in claim 1. Namely, Hirtzlin does not teach or suggest a waveguide device having a first substrate and a second substrate mounted within a waveguide. Specifically, the Applicant's claim 1 positively recites:

"A radio frequency (RF) propagation device comprising:

a waveguide for receiving electromagnetic radiation, the waveguide having a longitudinal axis;

a first substrate mounted within the waveguide and positioned transverse to the longitudinal axis thereof, the first substrate being substantially transmissive of the electromagnetic radiation and having a first probe formed thereon for transmitting or receiving at least a portion of the electromagnetic radiation;

a second substrate mounted within the waveguide and positioned transverse to the longitudinal axis thereof, the second substrate being substantially transmissive of the electromagnetic radiation and having a probe formed thereon for transmitting or receiving at least a portion of the electromagnetic radiation." (Emphasis added).

In contrast to the Applicant's invention, the substrates of Hirtzlin are not mounted within the waveguide. Rather, the substrates of Hirtzlin surround the waveguide and include openings through which the waveguide penetrates (See Hirtzlin, FIG. 2). While the probes of Hirtzlin extend into the waveguide, there is no teaching or suggestion that any portion of the substrates extend into the waveguide. By mounting the substrates within the waveguide, the Applicant's invention provides for a more compact solution than that of Hirtzlin. Moreover, Hirtzlin states that a surface of each of the substrates is metallized to form a ground plane. As such, if any portion of the substrates were to extend into the waveguide, then the propagation of radiation within the waveguide would be deleteriously affected. (See the Applicant's specification, ¶23). Thus, Hirtzlin clearly does not contemplate mounting any portion of the substrates within the waveguide.

"Anticipation requires the presence in a single prior art reference disclosure of each and every element of the claimed invention, arranged as in the claim." Lindemann Maschinenfabrik GmbH v. American Hoist & Derrick Co., 221 USPQ 481, 485 (Fed. Cir. 1984) (emphasis added). Since Hirtzlin does not teach a waveguide device having a first substrate and a second substrate mounted within a waveguide, Hirtzlin does not teach each and every element of the Applicant's claim 1. Therefore, the Applicant

contends that claim 1 is not anticipated by Hirtzlin and, as such, fully satisfies the requirements of 35 U.S.C. §102.

Furthermore, claim 17 recites an apparatus for interconnecting a plurality of planar circuits having relevant features similar to those recited in claim 1. Namely, a first substrate and at least one additional substrate are mounted within a waveguide. Therefore, the Applicant contends that claim 17 is not anticipated by Hirtzlin and, as such, fully satisfies the requirements of 35 U.S.C. §102.

III. REJECTION OF CLAIMS UNDER 35 U.S.C. §103(a)

A. Claims 2, 9, and 12

The Examiner rejected claims 2, 9, and 12 as being unpatentable over Hirtzlin in view of Chen (United States patent 4,598,262, issued July 1, 1986). The rejection is respectfully traversed.

More specifically, the Examiner conceded that Hirtzlin fails to show a waveguide for propagating two oppositely polarized signals and that Hirtzlin does not teach a grid substrate having a multiplicity of metallic lines to be reflective of one polarized signal and transmissive of the other polarized signal. (Office Action, page 4). The Examiner alleged, however, that Chen teaches a grid polarizer. (Office Action, page 4). The Examiner concluded that it would have been obvious to have used the grid polarizer of Chen with the waveguide device of Hirtzlin. (Office Action, page 4). The Applicant respectfully disagrees.

Chen generally teaches a waveguide filter device. (See Chen, Abstract). In particular, Chen shows the disposition of metal gratings or screens within a waveguide. The gratings or screens selectively filter among two orthogonal waveguide modes. (See Chen, col. 4, lines 1-15).

Claim 2 depends from claim 1 and recites additional features therefor. The alleged references, either singly or in any permissible combination, do not teach, suggest, or otherwise render obvious the Applicant's invention as recited in claim 1. Namely, the alleged combination fails to teach or suggest waveguide device having a first substrate and a second substrate mounted within a waveguide. Chen is

completely devoid of any teaching or suggestion of mounting substrates within a waveguide. As discussed above in Section II, Hirtzlin does not teach or suggest the mounting of substrates within a waveguide. Rather, in Hirtzlin, openings are formed in the substrates to allow a waveguide to pass therethrough. Since neither Hirtzlin nor Chen teaches or suggests waveguide device having a first substrate and a second substrate mounted within a waveguide, no conceivable combination of Hirtzlin and Chen renders the Applicant's invention obvious. In addition, Hirtzlin clearly teaches away from supporting substrates within the waveguide. Therefore, the Applicant contends that claim 2, which depends from claim 1, is patentable over the cited references and, as such, fully satisfies the requirements of 35 U.S.C. §103.

Claim 9 recites an RF propagation device having relevant features similar to those recited in claim 1. Namely, a first substrate, a second substrate, and a grid substrate are all mounted within a waveguide. For the same reasons discussed above, the Applicant contends that claim 9 is patentable over the cited references and, as such, fully satisfies the requirements of 35 U.S.C. §103. Finally, claim 12 depends from claim 9 and recites additional features therefor. Since the alleged combination of Hirtzlin and Chen does not render the Applicant's invention as recited in claim 9 obvious, dependent claim 12 is also nonobvious and is allowable.

B. Claims 4 and 18

The Examiner rejected claims 4 and 18 as being unpatentable over Hirtzlin in view of Suzuki (United States patent 6,043,789, issued March 28, 2000). The rejection is respectfully traversed.

More specifically, the Examiner conceded that Hirtzlin fails to show first and second dog channels proximate first and second probes within a waveguide. (Office Action, page 5). The Examiner alleged, however, that Suzuki shows a circular waveguide having probes mounted on a substrate and channels proximate the probes. (Office Action, page 5). The Examiner concluded that it would have been obvious to have modified Hirtzlin to employ the channels of Suzuki. (Office Action, page 5). The Applicant respectfully disagrees.

Suzuki generally teaches a waveguide having a first probe for detecting a first linearly polarized wave and a second probe for detecting a second linearly polarized wave. (See Suzuki, Abstract). In particular, the first probe is L-shaped and is disposed within the waveguide ahead of a circuit board. The second probe is patterned onto the circuit board. (Suzuki, col. 4, lines 22-61).

Claims 4 and 18 respectively depend from claims 1 and 17 and recite additional features therefor. The cited references, either singly or in any permissible combination, do not teach, suggest, or otherwise render obvious the Applicant's invention as recited in claims 1 and 17. Namely, the alleged combination fails to teach or suggest a waveguide device having a first substrate and a second substrate mounted within a waveguide. Suzuki is devoid of any discussion of multiple substrates disposed within a waveguide. Rather, Suzuki teaches a single circuit board. As discussed above, Hirtzlin does not teach or suggest the mounting of substrates within a waveguide. Rather, in Hirtzlin, openings are formed in the substrates to allow a waveguide to pass therethrough. Hirtzlin clearly teaches away from supporting substrates within the waveguide and thus no conceivable combination of Hirtzlin and Suzuki teaches or suggests waveguide device having a first substrate and a second substrate mounted within a waveguide. Therefore, the Applicant contends that claims 4 and 18, which depend from claims 1 and 17, are patentable over the cited references and, as such, fully satisfy the requirements of 35 U.S.C. §103.

C. Claim 6

The Examiner rejected claim 6 as being unpatentable over Hirtzlin in view of Raguenet (United States patent 6,091,373, issued July 18, 2000). The rejection is respectfully traversed.

More specifically, the Examiner conceded that Hirtzlin fails to show substrates formed of dielectric materials selected from the group of quartz, plastic, or glass. (Office Action, page 6). The Examiner alleged, however, that Raguenet teaches a waveguide having probes mounted on dielectric substrates such as a quartz filled polyimide film. (Office Action , page 6). The Examiner concluded that it would have been obvious to

have substituted the substrates of Raguenet in the waveguide device of Hirtzlin. The Applicant respectfully disagrees.

Raguenet generally teaches a feed line penetrating into a first cavity below a radiating element and a second feed line disposed orthogonal to the first feed line and penetrating into a second cavity located in-line with the first cavity. (See Raguenet, Abstract).

Claim 6 depends from claim 1 and recites additional features therefor. The cited references, either singly or in any permissible combination, do not teach, suggest, or otherwise render obvious the Applicant's invention as recited in claim 1. Namely, the alleged combination fails to teach or suggest a waveguide device having a first substrate with a first probe, and a second substrate with a second probe, mounted within a waveguide. Raguenet is devoid of any discussion of multiple substrates having disposed within a waveguide having probes. Rather, in Raguenet, the probes extend into cavities. As discussed above, Hirtzlin does not teach or suggest the mounting of substrates within a waveguide. Rather, in Hirtzlin, openings are formed in the substrates to allow a waveguide to pass therethrough. Hirtzlin clearly teaches away from supporting substrates within the waveguide and thus no conceivable combination of Hirtzlin and Raguenet teaches or suggests waveguide device having a first substrate and a second substrate mounted within a waveguide. Therefore, the Applicant contends that claim 6, which depends from claim 1, is patentable over the cited references and, as such, fully satisfies the requirements of 35 U.S.C. §103.

D. Claim 10

The Examiner rejected claim 10 as being unpatentable over Hirtzlin in view of Chen as applied to claim 9, and in further view of Suzuki. The rejection is respectfully traversed.

More specifically, the Examiner conceded that the combination of Hirtzlin and Chen fails to show first and second dog channels proximate first and second probes. (Office Action, page 7). The Examiner alleged, however, that it would have been

obvious in view of Suzuki to modify the waveguide device of Hirtzlin and Chen with dog channels. (Office Action, page 7). The Applicant respectfully disagrees.

Claim 10 depends from claim 9 and recites additional features therefor. The cited references, either singly or in any permissible combination, do not teach, suggest, or otherwise render obvious the Applicant's invention as recited in claim 9. Namely, the alleged combination fails to teach or suggest a waveguide device having a first substrate and a second substrate mounted within a waveguide. Chen is completely devoid of any teaching or suggestion of mounting substrates within a waveguide. Suzuki is devoid of any discussion of multiple substrates disposed within a waveguide. Rather, Suzuki teaches a single circuit board. As discussed above, Hirtzlin does not teach or suggest the mounting of substrates within a waveguide. Rather, in Hirtzlin, openings are formed in the substrates to allow a waveguide to pass therethrough. Hirtzlin clearly teaches away from supporting substrates within the waveguide and thus no conceivable combination of Hirtzlin, Chen, and Suzuki teaches or suggests waveguide device having a first substrate and a second substrate mounted within a waveguide. Therefore, the Applicant contends that claim 10, which depends from claim 9, is patentable over the cited references and, as such, fully satisfy the requirements of 35 U.S.C. §103.

E. Claim 13

The Examiner rejected claim 13 as being unpatentable over Hirtzlin in view of Chen as applied to claim 9, and in further view of Raguenet. The rejection is respectfully traversed.

More specifically, the Examiner conceded that the combination of Hirtzlin and Chen fails to show substrates formed of a dielectric selected from the group of quartz, plastic, or glass. (Office Action, page 8). The Examiner alleged, however, that it would have been obvious to employ the dielectrics of Raguenet with the waveguide device of Hirtzlin and Chen. (Office Action, page 8). The Applicant respectfully disagrees.

Claim 13 depends from claim 9 and recites additional features therefor. The cited references, either singly or in any permissible combination, do not teach, suggest,

or otherwise render obvious the Applicant's invention as recited in claim 9. Namely, the alleged combination fails to teach or suggest a waveguide device having a first substrate with a first probe, and a second substrate with a second probe, mounted within a waveguide. Chen is completely devoid of any teaching or suggestion of mounting substrates within a waveguide. Raguenet is devoid of any discussion of multiple substrates having disposed within a waveguide having probes. Rather, in Raguenet, the probes extend into cavities. As discussed above, Hirtzlin does not teach or suggest the mounting of substrates within a waveguide. Rather, in Hirtzlin, openings are formed in the substrates to allow a waveguide to pass therethrough. Hirtzlin clearly teaches away from supporting substrates within the waveguide and thus no conceivable combination of Hirtzlin, Chen, and Raguenet teaches or suggests waveguide device having a first substrate and a second substrate mounted within a waveguide. Therefore, the Applicant contends that claim 13, which depends from claim 9, is patentable over the cited references and, as such, fully satisfies the requirements of 35 U.S.C. §103.

CONCLUSION

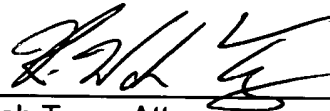
Thus, the Applicant submits that none of the claims presently in the application are anticipated under the provisions of 35 U.S.C. § 102, or obvious under the provisions of 35 U.S.C. § 103. Consequently, the Applicant believes that all these claims are presently in condition for allowance. Accordingly, both reconsideration of this application and its swift passage to issue are earnestly solicited.

If, however, the Examiner believes that there are any unresolved issues requiring adverse final action in any of the claims now pending in the application, it is requested

that the Examiner telephone Mr. Kin-Wah Tong, Esq. at (732) 530-9404 so that appropriate arrangements can be made for resolving such issues as expeditiously as possible.

Respectfully submitted,

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CERTIFICATE OF MAILING under 37 C.F.R. § 1.8(a)

I hereby certify that this correspondence is being deposited on September 25, 2003 with the United States Postal Service as first class mail, with sufficient postage, in an envelope addressed to the Commissioner for Patents, Mail Stop Non-Fee Amendment, P.O. Box 1450, Alexandria, VA 22313-1450.


Signature

9-25-03
Date of signature

IN THE DRAWINGS

Please amend FIG. 2 as shown by the red-line mark-up in the attached annotated drawing sheet, which was required by the Examiner in the Office Action. In particular, the reference character "207" is added. A replacement drawing sheet showing amended FIG. 2 is attached hereto.